

# PATENT SPECIFICATION

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## (54) ACID CREAM-LIKE TOPPING

(71) We, UNILEVER LIMITED, a company organised under the laws of Great Britain, of Unilever House, Blackfriars, London E/C 4, England, do hereby declare the invention for which we pray that a patent may be granted to us and the method by which it is to be performed, to be particularly described in and by the following statement:—

The invention relates to the preparation of a whipped stabilized cream product useful as a topping for desserts such as fruit jellies.

There is a need for whipped cream products that are sufficiently stable, both physically and against bacterial infection, to be stored and distributed either alone or in conjunction with desserts such as fruit jellies. In general it has been believed that lowering the pH of a whipped cream product, whereby it becomes more resistant to bacterial infection, is incompatible with physical stability and in any case would lead to products with unacceptable taste and texture (see for example M. E. Schulz in *Milchwissenschaft*, 26 (1971) 481—6, particularly paragraph IV, in which it is stated that products like whipping cream, cream preparations and filled cream lose their foamability at pH values of 4.9 and below).

It has now been found that a mixture of cream, calculated as cream having a fat content of 40% by weight, and an acidified milk product can be stabilized and whipped to give a product having adequate stability for normal storage and distribution, particularly at chilled temperatures (about 3 to 10°C), and has adequate taste and texture, particularly when used with fruit desserts the weight ratio of the cream to acidified milk product being in the range 50:50 to 80:20.

The invention provides a process for the preparation of a whipped topping based on cream and an acidified milk product, which comprises:

- (i) admixing cream having a fat content of about 40% by weight with an acidified milk product having a non-fat dry matter content of from 9 to 20%,

by weight, and optionally with a small amount of stabilizer and/or emulsifier, and optionally with sweetening and preserving agents, the weight ratio of the cream to acidified milk product being in the range 50:50 to 80:20;

- (ii) whipping the mixture obtained by step (i) with an industrial whipping apparatus; and

- (iii) filling the products into a container;

whereby the amounts of cream and acidified milk product are such that the whipped topping has a fat content of from 18 to 32% by weight, a dry matter content of from 30 to 45% by weight and a pH in the range of from 5.5 to 3.8.

As acidified milk products having a non-fat dry matter content of from 9 to 20% by weight, quark and/or yoghurt or a mixture thereof can be used. Quark is sometimes preferable because it gives less whey separation than yoghurt. However, the use of yoghurt has the advantage that a higher overrun is obtained (150—210%), whereas the overrun of a product containing quark as the acidified milk product is usually between 60 and 110% by volume. Moreover, the products containing yoghurt are more cream-like than the products containing quark and the use of a larger amount of stabilizers can decrease the whey separation. The preferred ratio of amounts of cream, calculated as 40% cream, and the acidified milk products within the range 60:40 to 70:30.

The whipped cream product will normally have a pH of from 5.5 to 3.8, preferably from 4.5 to 4.0. This pH can in principle be obtained by the addition of an edible acid to the milk product, but because of taste and texture, fermented acid milk products, in which the acid has been developed by microbiological fermentation, are preferred.

The presence of a stabilizer is desirable for decreasing or avoiding whey separation during storage. Preferred stabilizers are locust bean gum, guar gum, gelatin and carrageenan, but also starch or modified starches can be used. A suitable emulsifier

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is one containing partial glycerides, but also other edible emulsifiers can be used.

The acidified milk product having a non-fat dry matter content of from 9 to 20% by weight can contain fat, such as quark or yoghurt prepared from whole milk, but in that case the amount of cream added should be correspondingly decreased or a cream with a lower fat content should be used in order to obtain a final product with the required fat content.

In principle any edible vegetable or animal fat can be used but milk fat is preferable in view of its excellent taste.

Additional sugar, flavours and other minor ingredients and, for long storage, anti-bacterial agents such as sorbic acid can be incorporated in the mixture.

The overrun of the whipped topping is usually between 60 and 210%, by volume.

The best results are obtained when step (i), that is the mixing of cream and acidified milk product, is carried out while the ingredients have a temperature of below 10°C, particularly when cream and acidified milk product are stored at least one night below 10°C before mixing. The whipping step is usually carried out below 20°C, preferably also below 10°C, but of course above 0°C.

It will be appreciated that the invention also extends to the mixture prior to whipping and to the dessert products, particularly fruit desserts, to which the whipped mixture has been added.

In this specification all percentages and parts are by weight, unless otherwise stated.

The invention will now be illustrated by the following examples.

#### EXAMPLE I

The following mixture was prepared:

skim milk quark (18.5% solids)	27%
cream (40% fat)	63%
carragheenan	0.1%
glycerol monostearate	0.9%
saccharose	9%
sorbic acid	900 ppm

The mixture having a pH of about 5.2 was whipped to an overrun of about 67%, by volume, and found to have excellent stability and usefulness as a whipped topping for, for instance, fruit jelly.

#### EXAMPLE II

Whipped toppings were made of the following composition:

Bulgarian yoghurt	40%
cream (40% fat)	43%
emulsifier	0.83%
stabilizer	0.19%
saccharose	9.17%
potassium sorbate solution (33%)	0.17%
water	6.26%

The emulsifier used was a commercial product containing about 16% distilled mono-glyceride, about 28% water, about 9% saccharose and about 36% polyalcohols containing 3—6 carbon atoms.

The stabilizers were varied as follows:

- (a) chemically modified starch
- (b) pre-cooked amylopectine
- (c) an extract of red algae sold under the trade name Aubygum
- (d) carragheenan
- (e) corn starch
- (f) cold-soluble pre-gelatinised corn starch
- (g) gelatine
- (h) mixture of carragheenan and locust bean gum in a ratio of 9:10.

The yoghurt and cream were stored for one night in a refrigerator at a temperature below 10°C.

The emulsifier was admixed with the water at about 60°C under intensive stirring. The cold cream and yoghurt were admixed in a mixing apparatus, known under the name "Morton Whisk", under slow stirring. Then the emulsifier/water mixture, the dry ingredients and the sorbate solution were admixed. The apparatus was pressurized with nitrogen (about 2 kg/cm<sup>2</sup>) and the product was whipped under heavy stirring. After 2 minutes the product was filled in tubs and stored in a refrigerator (temperature about 5°C). The overrun and the pH were determined shortly after whipping. The overrun varied from 170 to 200%, by volume, and the pH varied from 3.9 to 4.2. With some products a slight whey separation was observed.

#### EXAMPLE III

Example II was repeated except that the amounts of yoghurt and cream were 20% and 63%, respectively, instead of 40% and 43%.

The products had an overrun varying from 150 to 209%, by volume, a pH varying from 4.4 to 4.5, and a cream-like structure. Although the yoghurt containing products have a relative low pH, they had a fresh, but not pronounced acid, flavour.

#### EXAMPLE IV

Example II was repeated except that the mixture contained 33.35% skim milk curd containing about 17% dry solids instead of yoghurt and 50.03% instead of 43% cream.

The products had an overrun of about 60%.

#### EXAMPLE V

The procedure of Example IV was repeated except that the stabilizer was omitted. The product had the same overrun, but it showed much whey separation.

## EXAMPLE VI

On a pilot plant scale a mixture containing 80 kg curd having a dry solids content of about 17%, 120 kg cream (40%), 2 kg of the same emulsifier as used in Example II, 0.153 kg locust bean gum, 22 kg saccharose and 0.4 kg potassium sorbate solution (33%) was treated in a continuous whipping equipment known as "Ooms mixer".

The nitrogen pressure was 8 kg/cm<sup>2</sup> and the back-pressure was 5 kg/cm<sup>2</sup>, the rotor speed was about 425 rpm and the pump speed was minimal. The product had a reasonably good consistency and an overrun of about 100%, by volume.

## EXAMPLE VII

A mixture of 0.6 kg curd, 1.4 kg cream, 0.02 kg of the same emulsifier as used in Example II, 0.2 kg saccharose, 4 g 30% potassium sorbate solution and 2.2 g guar gum were mixed for 30 seconds in a "Morton Wisk" equipment. The product had an overrun of 89%.

## WHAT WE CLAIM IS:—

1. A process for the preparation of a whipped topping based on cream and an acidified milk product, which comprises:

- (i) admixing cream having a fat content of about 40% by weight with an acidified milk product having a non-fat dry matter content of from 9 to 20% by weight, and optionally with a small amount of stabilizer and/or emulsifier, and optionally with sweetening and preserving agents, the weight ratio of the cream to the acidified milk product being in the range of 50:50 to 80:20;
- (ii) whipping the mixture obtained by step (i) with an industrial whipping apparatus; and
- (iii) filling the product into a container;

whereby the amounts of cream and acidified milk product are such that the whipped topping has a fat content of from 18 to 32% by weight, a dry matter content of from 30 to 45% by weight and a pH in the range of from 5.5 to 3.8.

2. A process according to Claim 1, in which the acidified milk product having a

non-fat dry matter content of from 9 to 20% by weight is quark or yoghurt or a mixture thereof.

3. A process according to Claim 1 or Claim 2, in which the ratio of the amounts of cream, calculated as 40% cream, to the amount of the acidified milk product is within the range 60:40 to 70:30.

4. A process according to any one of Claims 1 to 3, in which the emulsifier containing mono- and/or diglycerides is used.

5. A process according to any one of Claims 1 to 4, in which a stabilizer containing carragheenan, locust bean gum, guar gum, gelatin, starch or modified starch, or a mixture thereof, is used.

6. A process according to any one of Claims 1 to 5, in which step (i) is carried out with cream and acidified milk product having a temperature of below 10°C.

7. A process according to any one of Claims 1 to 6, in which step (ii) is carried out at a temperature below 20°C.

8. A process according to Claim 7, in which step (ii) is carried out at a temperature below 10°C.

9. A process according to any one of Claims 1 to 8, in which the product is whipped to an overrun in the range of from 60 to 210%, by volume.

10. A process according to any one of Claims 1 to 9, in which the pH of the products is adjusted to a value of from 4.0 to 4.5.

11. A process according to Claim 1 substantially as described with particular reference to any one of the examples.

12. A whipped topping prepared according to a process as claimed in any one of Claims 1—12.

13. A whipped topping according to Claim 12 having an overrun in the range of from 60 to 210%, by volume.

14. A whipped topping according to Claim 12 or Claim 13 having a pH of from 4.0 to 4.5.

15. A whipped topping according to Claim 12 substantially as described with particular reference to any one of the Examples.

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